

CLAIMS

[Claim 1]

A reproducing apparatus for reproducing data to be stored in a data storage medium, characterized by
5 including:

synchronization pattern detecting means for detecting a synchronization pattern which is detected from a reproduced signal from the data storage medium and which is contained in the data;

10 error detecting means for detecting an error between the reproduced signal and a reference point specified by a time at which a half cycle has elapsed from a start time of one cycle of a clock signal reproduced from the reproduced signal, and by an
15 amplitude of the reproduced signal; and

correcting means for correcting a deviation of the data from the clock signal, on the basis of a difference between an interval of the synchronization pattern detected and a predetermined period, and of a time for a
20 segment in which it is assumed, from the error detected, that the deviation of the data from the clock signal has occurred, out of segments into which the interval of the synchronization pattern is divided.

[Claim 2]

25 The reproducing apparatus according to Claim 1, characterized in that:

the synchronization pattern detecting means includes:

detection range setting means for setting a
30 detection range from which the synchronization pattern is detected, on the basis of a count value of the clock

signal; and

synchronization pattern detection signal
inserting means for inserting a signal representing
detection of the synchronization pattern, at a time
5 specified by the period predetermined, where the
synchronization pattern has not been detected within the
detection range.

[Claim 3]

The reproducing apparatus according to Claim 1,
10 characterized in that:

the error detecting means detects a phase error,
which is an error in a time direction between the
reference point and the reproduced signal, and

the correcting means corrects the deviation of the
15 data from the clock signal, on the basis of the
difference between the interval of the synchronization
pattern detected and the period predetermined, and of the
time for the segment in which it is assumed, from the
phase error detected, that the deviation of the data from
20 the clock signal has occurred, out of the segments into
which the interval of the synchronization pattern is
divided.

[Claim 4]

The reproducing apparatus according to Claim 1,
25 characterized in that:

the error detecting means detects a zero-crossing
offset, which is an error in an amplitude direction
between the reference point and the reproduced signal,
and

30 the correcting means corrects the deviation of the
data from the clock signal, on the basis of the

difference between the interval of the synchronization pattern detected and the period predetermined, and of the time for the segment in which it is assumed, from the zero-crossing offset detected, that the deviation of the data from the clock signal has occurred, out of the segments into which the interval of the synchronization pattern is divided.

[Claim 5]

The reproducing apparatus according to Claim 1, characterized in that:

the correcting means includes:

deviation amount detecting means for detecting the difference between the interval of the synchronization pattern and the period predetermined, on the basis of the clock signal, as a deviation amount;

error integrating means for integrating the error for each of the segments;

deviation occurrence time detecting means for detecting a deviation occurrence time, which is a time for the segment in which an absolute value of the integrated value integrated becomes maximum between two successive ones of the synchronization patterns;

a FIFO (First In First Out) buffer for storing the data of a period longer than the period predetermined; and

control means for controlling the FIFO buffer such that the data of a period from the deviation occurrence time to detection of the synchronization pattern is moved in a time direction so as to correspond to the deviation amount, on the basis of the deviation amount and the deviation occurrence time, in a case where

the deviation amount other than 0 has been detected.

[Claim 6]

A reproducing method for reproducing data to be stored in a data storage medium, characterized by

5 including:

a synchronization pattern detecting step of detecting a synchronization pattern which is detected from a reproduced signal from the data storage medium and which is contained in the data;

10 an error detecting step of detecting an error between the reproduced signal and a reference point specified by a time at which a half cycle has elapsed from a start time of one cycle of a clock signal reproduced from the reproduced signal, and by an
15 amplitude of the reproduced signal; and

a correcting step of correcting a deviation of the data from the clock signal, on the basis of a difference between an interval of the synchronization pattern detected and a predetermined period, and of a time for a
20 segment in which it is assumed, from the error detected, that the deviation of the data from the clock signal has occurred, out of segments into which the interval of the synchronization pattern is divided.

[Claim 7]

25 A program for a reproduction process by which data to be stored in a data storage medium is reproduced, the program characterized by including:

a synchronization pattern detecting step of detecting a synchronization pattern which is detected
30 from a reproduced signal from the data storage medium and which is contained in the data;

an error detecting step of detecting an error between the reproduced signal and a reference point specified by a time at which a half cycle has elapsed from a start time of one cycle of a clock signal reproduced from the reproduced signal, and by an amplitude of the reproduced signal; and

a correcting step of correcting a deviation of the data from the clock signal, on the basis of a difference between an interval of the synchronization pattern detected and a predetermined period, and of a time for a segment in which it is assumed, from the error detected, that the deviation of the data from the clock signal has occurred, out of segments into which the interval of the synchronization pattern is divided.

[Claim 8]

A program for causing a computer to perform a process by which data to be stored in a data storage medium is reproduced, the program characterized by including:

a synchronization pattern detecting step of detecting a synchronization pattern which is detected from a reproduced signal from the data storage medium and which is contained in the data;

an error detecting step of detecting an error between the reproduced signal and a reference point specified by a time at which a half cycle has elapsed from a start time of one cycle of a clock signal reproduced from the reproduced signal, and by an amplitude of the reproduced signal; and

a correcting step of correcting a deviation of the data from the clock signal, on the basis of a difference

between an interval of the synchronization pattern
detected and a predetermined period, and of a time for a
segment in which it is assumed, from the error detected,
that the deviation of the data from the clock signal has
5 occurred, out of segments into which the interval of the
synchronization pattern is divided.